

Amendments to the Claims

Claim 1 (Currently amended): A method for treating conditions associated with the response of acid-sensing ion channels of the DEG/ENaC channel family comprising administering ~~an agonist, antagonist, or modulator of a composition that inhibits, activates or modulates~~ the acid-sensing ion channels in the presence or absence of FMRFamide or FMRFamide-related peptides in a therapeutically-effective amount.

Claim 2 (Original): The method of claim 1 wherein the condition is selected from the group consisting of pain, altered taste sensation, behavior disorder, neurologic disease, psychiatric disease, altered blood pressure, altered respiration, and opioid addiction.

Claim 3 (New): A method for treating conditions associated with the response of acid-sensing ion channels of the DEG/ENaC channel family comprising:  
identifying a composition for inactivating the current in acid-sensing ion channels of the DEG/ENaC channel family, comprising:  
administering said composition to a cell expressing acid-ion sensing channels of the DEG/ENaC channel family in the presence of acid and in the presence of FMRFamide or FMRFamide-related peptides;  
measuring the current of the channels of said cell; and  
comparing the current of said cell in the presence and absence of said composition,  
wherein inactivation of the sustained current of said cell in the presence of said composition indicates that the composition is suitable for treating conditions

associated with the response of acid-sensing ion channels of the DEG/ENaC channel family; and  
administering said composition to a subject in need thereof.

**Claim 4 (New):** A method for treating conditions associated with the response of acid-sensing ion channels of the DEG/ENaC channel family to acidosis such as nociception comprising:

identifying a composition that alters the activity of acid-sensing ion channels of the DEG/ENaC channel family, comprising:  
providing a cell expressing acid-ion sensing channels of the DEG/ENaC channel family;  
treating said cell with a composition in the presence of acid and in the presence FMRFamide or FMRFamide-related peptides;  
detecting a change in activity of said an acid-ion sensing channels of the DEG/ENaC channel family, thereby identifying a compound that modifies activity of acid-ion sensing channels of the DEG/ENaC channel family; and  
administering said composition to a subject in need thereof.

**Claim 5 (New):** The method of claim 4 wherein said change in activity is determined by measuring electrophysical analysis.

**Claim 6 (New):** The method of claim 5 wherein electrophysical analysis comprises measuring cell current.

Claim 7 (New): The method of claim 4 wherein said change in activity is determined using an assay that measures the opening and closing of said channels.

Claim 8 (New): The method of claim 5 wherein said assay comprises a voltage sensitive dye.

Claim 9 (New): The method of claim 5 wherein said assay comprises an ion-sensitive dye.

Claim 10 (New): The method of claim 4 wherein said assay measures cell death.

Claim 11 (New): A method for treating conditions associated with the response of acid-sensing ion channel alpha (ASIC $\alpha$ ) comprising:  
screening for a composition capable of inhibiting, activating or modulating channel activity of ASIC $\alpha$  comprising:

contacting an FMRFamide or FMRFamide-related peptides with an ASIC $\alpha$  protein in the presence of acid and a test composition;

analyzing the binding of the FMRFamide or FMRFamide-related peptides and the ASIC $\alpha$  protein, wherein a perturbation of binding indicates that the test composition inhibits or activates FMRFamide or FMRFamide-related peptides-ASIC $\alpha$  protein interaction; and

providing a cell expressing ASIC $\alpha$  channels;

treating said cell with a composition in the presence of acid and in the presence

FMRFamide or FMRFamide-related peptides;

detecting a change in activity of said ASIC $\alpha$  channels, thereby identifying a composition that modifies, activates, or inhibits activity of an ASIC $\alpha$  channel; and administering said composition to a subject in need thereof.